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The polar equation to the locus of Q is obviously

$$r \sin\left[\frac{\pi}{12} - \frac{1}{6}\left(\theta - \frac{\pi}{4}\right)\right] = 2\sqrt{2}\, a \cos\left(\theta - \frac{\pi}{4}\right);$$

or

$$r \sin\left(\frac{\pi}{8} - \frac{\theta}{6}\right) = 2\sqrt{2}\, a \cos\left(\theta - \frac{\pi}{4}\right).$$

It may be written

$$r\left[\sqrt{2-\sqrt{2}}\cos\frac{\theta}{6} - \sqrt{2+\sqrt{2}}\sin\frac{\theta}{6}\right] = 4\, a\, (\cos\theta - \sin\theta).$$

Occultation of 80 *Virginis by the Moon, observed at Forest Lodge, Maresfield, on May* 30, 1871. By Capt. Noble.

The star disappeared instantaneously at the Moon's dark limb

At $14^{h}\ 25^{m}\ 5^{s}$ L.S.T. = $9^{h}\ 53^{m}\ 13^{s}{\cdot}9$ L.M.T.

and reappeared at the bright limb (from behind a dome-shaped mountain)

At $15^{h}\ 14^{m}\ 48^{s}$ L.S.T. = $10^{h}\ 42^{m}\ 48^{s}{\cdot}8$ L.M.T.

These times are very good, although the atmosphere was unsteady. The power employed was 255, with my 4·2-inch Ross Equatoreal, and was adjusted on the star.

Observations of Winnecke's Comet. By the Rev. S. J. Perry.

Owing to the unusually bad weather in April and at the beginning of May, I was unable to observe this comet for a long time after its discovery. When the sky permitted of a first observation, the twilight and the nearness of the Sun rendered the object much less distinct than it had previously been, though it was still much more conspicuous than the comets of 1870.

The following positions may serve to complete the series of observations made by others more favoured by fair weather. The nearest Greenwich star ι *Aurigæ*, was chosen as the star of comparison, but an intermediate double-star was also made use of to diminish the chances of error.

	G.M.T. h m		R.A.	Decl.
May 8	10 8	ι Aurigæ	4 48 34·2	+32 57 31·4
		Dist. of Comet	− 20 37	+ 2 5 30
		Comet	4 27 57·2	35 3 1·4

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	G.M.T.		R.A.	Decl.
	h m			
May 8	9 57	ι Aurigæ	4 48 34·2	32 57 31·3
		Dist. of Comet	−17 36	+1 22 35
		Comet	4 30 58·2	34 20 6·3
10	9 43	ι Aurigæ	4 48 34·2	32 57 31·3
		Dist. of Comet	−14 22	+37 40
		Comet	4 34 12·2	33 35 11·3

Observations were also taken on the 11th and 12th, but the nearness of the comet to the horizon and the passing clouds rendered the results less trustworthy.

Stonyhurst College Observatory,
June 6, 1871.

On the Total Solar Eclipse of 1871, *December* 11–12, *on the Australian Continent.* By J. R. Hind, F.R.S.

The total eclipse of the Sun in December next would be most advantageously observed on the northern coast of Australia. I am not aware, however, that the track of country situated within the zone of totality is anywhere colonised, and to secure observations it would probably be necessary to send round observers from Sydney or Melbourne.

To afford an idea of the circumstances of the eclipse in this region, I have selected four points near the coast from the Admiralty map of North Australia, and have made special calculations for these points, taking the elements of the eclipse from the *Nautical Almanac.*

The positions selected are—

	Long.	Lat.
	° ′	° ′
Vansittart Bay (S. extremity)	126 18 E.	14 10 S.
Mount Casuarina	127 37	14 23
Pearce Point	129 22	14 27
Groote Eylandt (S.E. extremity)	137 2	14 15
Cape Sidmouth	143 38	13 25

The following are my results:—

		Totality Begins.	Totality Ends.	Duration of Totality.	Sun's Alt.
		h m s	h m s	m s	°
Vansittart Bay	Dec. 12	0 48 9·3	0 52 16·7	4 7·4	74
Mount Casuarina	,,	0 56 57·6	1 1 13·5	4 15·9	72
Pearce Point	,,	1 9 1·3	1 13 13·1	4 11·8	70
Groote Eylandt	,,	2 0 16·2	2 3 59·5	3 43·3	59
Cape Sidmouth	,,	2 41 37·2	2 45 3·9	3 26·7	49

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The first and last contacts occur as below :—

		First Contact.		Last Contact.
		h m		h m
Vansittart Bay	Dec. 11	23 15	Dec. 12	2 25
Mount Casuarina	„	23 24	„	2 34
Pearce Point	„	23 37	„	2 45
Groote Eylandt	Dec. 12	0 33	„	3 31
Cape Sidmouth	„	1 20	„	4 7

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Printed by Strangeways and Walden, Castle St. Leicester Sq. and Published
at the Apartments of the Society, July 20, 1871.